



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,347	07/08/2003	Gregory A. Becker	PA3166US	7831
22830	7590	07/10/2007	EXAMINER	
CARR & FERRELL LLP 2200 GENG ROAD PALO ALTO, CA 94303			PHAM, KHANH B	
ART UNIT		PAPER NUMBER		
2166				
MAIL DATE		DELIVERY MODE		
07/10/2007		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

**MAILED**

**JUL 10 2007**

**Technology Center 2100**

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/614,347

Filing Date: July 08, 2003

Appellant(s): BECKER ET AL.

---

Kenneth M. Kaslow  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed February 21, 2007 appealing from the Office action mailed Jun 30, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1-12, 14-15, 20, 26-32** are rejected under 35 U.S.C. 102(e) as being anticipated by Goldstein et al. (US 6,665,815 B1), hereinafter “**Goldstein**”.

**As per claim 1**, Goldstein teaches a method for maintaining a backup storage system for a data storage system comprising:

- “receiving a plurality of data writes from an application program, the plurality of data writes occurring between a first time and a second time” at Col. 5 lines 44-48 and Fig. 3;
- “determining a backward increment between data on the data storage system at the second time and data on the data storage system at the first time based on the plurality of data writes from the application program to the data storage system” at Col. 6 lines 6-60 and Fig. 7;

- “storing the backward increment” at Col. 6 lines 6-31;
- “storing the plurality of data writes” at Col. 6 lines 6-31;
- “and updating the backup storage system so that the data on the data storage system at the second time is the same as the data on the backup storage system at the second time” at Col. 6 lines 6-31.

**As per claim 2**, Goldstein teaches the method of claim 1, further comprising: “determining a forward increment between the data on the data storage system at the first time and the data on the data storage system at the second time based on the plurality of data writes” at Col. 4 lines 1-50 and Figs. 4, 6.

**As per claim 3**, Goldstein teaches the method of claim 2, further comprising: “associating the backward increment with the forward increment” at Col. 8 lines 65-67.

**As per claim 4**, Goldstein teaches the method of claim 2, further comprising: “storing the forward increment; and storing the association of the backward increment and the forward increment” at Col. 9 lines 1-8.

**As per claim 5**, Goldstein teaches the method of claim 1, further comprising: “storing indicia of the plurality of data writes” at Col. 4 lines 11-40.

**As per claim 6**, Goldstein teaches the method of claim 1, wherein “said updating the backup storage system comprises: applying each of the plurality of data writes to an image of data on the backup storage system, thereby recreating the data on the data storage system at the second time” at Col. 6 lines 6-31 and Figs. 7-11.

**As per claim 7**, Goldstein teaches the method of claim 6, “said applying each of the plurality of data writes comprising: updating the image of the data stored on the backup storage system with the plurality of data writes” at Col. 6 lines 6-31 and Figs. 7-11.

**As per claim 8**, Goldstein teaches the method of claim 1, wherein “said updating the backup storage system comprises: optimally applying the plurality of data writes to the backup storage system, thereby recreating the data on the data storage system at the second time” Col. 6 lines 6-31 and Figs. 7-11.

**As per claim 9**, Goldstein teaches the method of claim 1, wherein “a difference between the first time and the second time is a predetermined time period” at Col. 3 lines 55-67.

**As per claim 10**, Goldstein teaches the method of claim 1, wherein “a difference between the first time and the second time is a variable time period” at Col. 3 lines 55-67.

**As per claim 11**, Goldstein teaches the method of claim 10, wherein “a difference between the first time and the second time is dependent on the rate of the plurality of data writes” at Col. 3 lines 55-67.

**As per claim 12**, Goldstein teaches the method of claim 7, wherein “a difference between the first time and the second time is dependent on a quantity of the plurality of data writes” at Col. 3 lines 55-67.

**As per claim 14**, Goldstein teaches the method of claim 1, wherein “said updating the backup storage system so that the data on the data storage system at the second time is the same as the data on the backup storage system at the second time includes applying the backward increment to an image of data on+6 the backup storage system, thereby recreating the data on the data storage system at the second time” at Col. 6 lines 6-31.

**As per claim 15**, Goldstein teaches the method of claim 14, wherein “said updating the backup storage system so that the data on the data storage system at the second time is the same as the data on the backup storage system at the second time includes applying an individual data write to the image of data on the backup storage system, thereby recreating the data on the data storage system at a point in time between the first time and the second time” Col. 6 lines 6-31 and Figs. 7-11.

**As per claim 20**, Goldstein teaches the method for using a backup storage system for a data storage system comprising:

- “receiving a plurality of data writes captured between an application and the data storage system, the plurality of data writes occurring between a first time and a second time” at Col. 5 lines 44-48 and Fig. 3;
- “identifying data blocks in the data storage system that were changed based on the plurality of data writes” at Col. 5 lines 23-48;
- “applying the plurality of data writes to an image on the backup storage system” at Col. 6 lines 6-31;
- “determining a forward increment between data on the data storage system at the first time and data on the data storage system at the second time based on the plurality of data writes” at Col. 3 line 55 to Col. 4 line 50 and Figs. 4, 6;
- “determining a backward increment between data on the data storage system at the second time and data on the data storage system at the first time based on a plurality of data writes” at Col. 6 lines 6-31 and Figs. 7-11;
- “storing the forward increment” at Col. 3 line 55 to Col. 4 line 50 ;
- “storing the backward increment” Col. 6 lines 6-31 and Figs. 7-11;
- “storing the plurality of data writes” Col. 6 lines 6-31 and Figs. 7-11;
- “and updating the backup storage system so that the data on the data storage system at the second time is the same as the data on the backup storage system at the second time” at Col. 6 lines 6-31 and Figs. 7-11.

**Claims 26-32** recite a system for performing similar method as in claims 1-12, 14-15 and therefore rejected by the same reasons.

#### **(10) Response to Argument**

##### Grouping of claims

Appellant has grouped the claims in two groups, group #1 comprises claims 1-12 and 14-15, Group #2 comprises claims 20 and 26-32. However, claims 20 and 26 are independent claims and **the scope of claim 26 is not the same as claim 20**. For group #2, appellant presented arguments for claim 20 only, and these arguments do not apply to claim 26. The failure of appellant to separately argue claims which appellant has grouped together constitutes a waiver of any argument that the Board must consider the patentability of any grouped claim separately. See *In re McDaniel*, 293 F.3d 1379, 1384, 63 USPQ2d 1462, 1465-66 (Fed. Cir 2002).

##### Summary of Appellant's invention and Goldstein reference.

Appellant's invention is directed to method for maintaining a backup storage system 340 for a data storage system 300 (See Fig. 3 and paragraphs [1100]-[1101]) in which the

replicated image 356 is a backup copy of the production image 326. Data writes from application 302 causes the production image to change, and **forward increment**  $\Delta D_{01}$  represents the changes to the production image 326 between points  $T_0$  and  $T_1$ , which must be made to a backup image 356 so that the backup image is the same as the production image 326 at  $T_1$ . Similarly, **backward increment**  $\Delta D_{10}$  represents the changes to the production image 326 between points  $T_1$  and  $T_0$ , which must be made to a backup image 356 so that the backup image 356 is the same as the production image 326 at  $T_0$ . In Fig. 4 reproduced below, the arrows from left to right represent forward increment and the arrows from right to left represent backward increment.

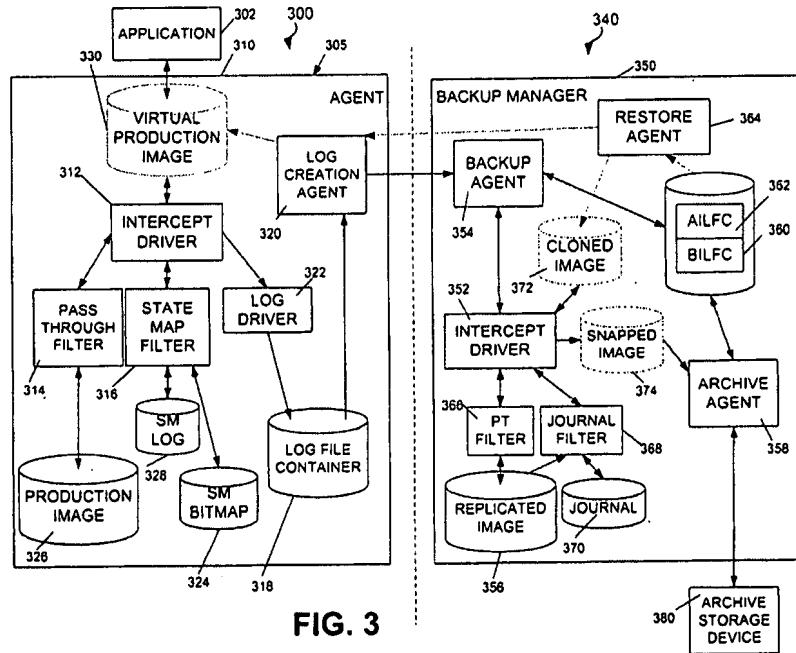


FIG. 3

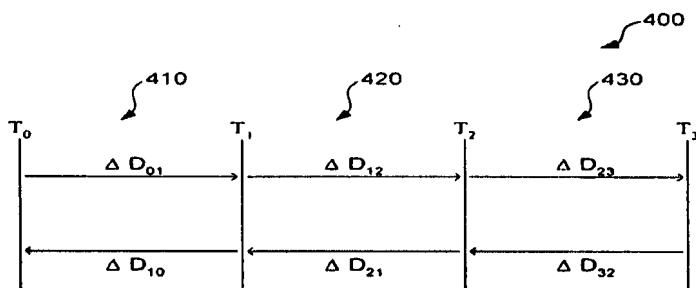


Fig. 4

Goldstein teaches a method for backing up a data volume in a computer system. As seen in Fig. 4 below and Col. 4 lines 1-40, at time  $T_0$ , a backup copy  $B_0$  of the data volume is created. At time  $T_1$ , a succedent snapshot different list 121 represent changes to the data volume between point  $T_0$  and  $T_1$  is obtained. The succedent snapshot different list  $S_{01}$  is used to update the backup copy  $B_0$  so that the backup copy is the same as the data volume at  $T_1$ .

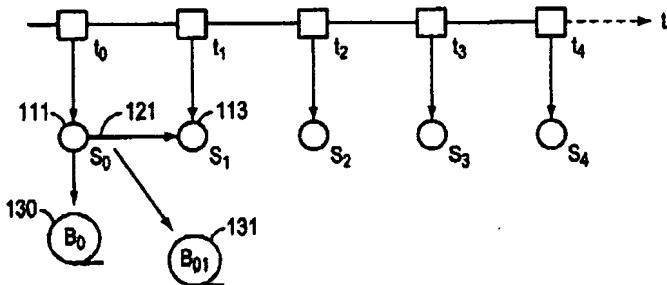


FIG. 4

Similarly, Goldstein also teaches at Col. 6 lines 6-30 and Fig. 7 a precedent snapshot different list  $S_{10}$  (i.e.  $S_1 \rightarrow S_0$ ) represents changes to the data volume between points  $T_1$  and  $T_0$ , which must be made to the backup image so that backup copy is the same as the data volume at  $T_0$ .

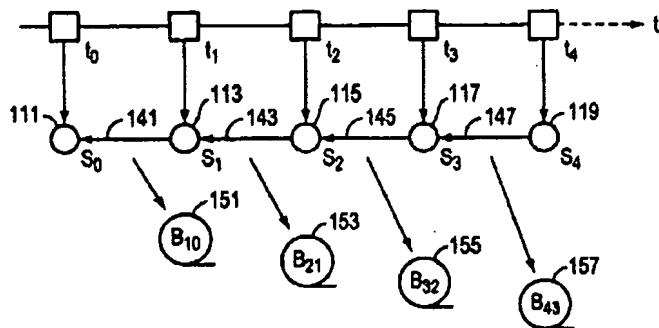


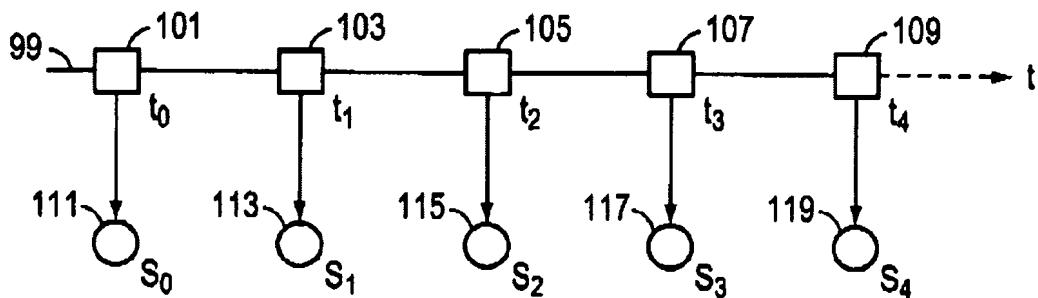
FIG. 7

As seen above, the claimed limitations “forward increment” and “backward increment” are similar to Goldstein’s “succedent backup” and “precedent backup”, respectively. Appellant admitted in the Brief, page 9 , 2<sup>nd</sup> paragraph that “it is **possible**, under circumstances, for data recovered according to one of the snapshots taken in Goldstein to be **similar** to the data recovered at a particular point in time in the present application” and “**similar result may sometime accomplished**”. Goldstein’s system therefore anticipated appellant’s claimed invention.

Appellant’s main argument is that Goldstein uses snapshots of the storage system, which is analogous to taking pictures, while appellant’s method of using data writes is analogous to taking videos. However, from technical point of view, taking videos is same as taking multiple pictures within a short time period (e.g., 29 pictures/frames per second for NTSC). Appellant seems to concentrate on the point that “data writes are utilized to recover data at any point in time” and “because Goldstein take snapshots of the disk volume and does not continuously received data writes, Goldstein cannot recover data at any point in time”. However, it is noted that the features upon which appellant relies are **not recited in the rejected claim(s)**. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Response to arguments regarding Claim 1.

In response to appellant argument that Goldstein never receives a plurality of data writes from an application program, the plurality of data writes occurring between a first time and a second time, the examiner respectfully submits that "data writes" are the actions which cause the changes to the data in storage devices. Without "data writes", backup systems are unnecessary. Goldstein teaches an incremental backup method that "only those data blocks that have changed are copied" or "only the data block containing the updated record are backed up". Therefore, it is unreasonable to state that "Goldstein never receives a plurality of data writes from an application program" because the data blocks can't be updated, modified or deleted without "data writes from an application program." As seen in Fig. 3 reproduced below, at time  $t_0$ , Goldstein takes a snapshot  $S_0$  of the data volume 101, at time  $t_1$ , the data writes causes the data volume 101 to change to 103 and the new snapshot  $S_1$  are taken.



**FIG. 3**

The difference between the two snapshots is therefore same as "plurality of data writes" applied to the first snapshot, because:

First Snapshot  $S_0$  + Data Writes = Second Snapshot  $S_1$

therefore:

Second snapshot  $S_1$  - First snapshot  $S_0$  = Data Writes

or:

The difference between two snapshot = Plurality of Data Writes

Appellant further argued that Goldstein does not teach "determining a backward increment between data on the data storage system at the second time and data on the data storage at the first time based on the plurality of data writes from the application to the data storage system". On the contrary, as discussed in the summary of the Goldstein reference above, Goldstein, at Col. 6 lines 6-60, determines a precedent snapshot difference list which represents changes to the data volume between points  $T_1$  (i.e., "second time") and  $T_0$  (i.e., "first time") based on the difference between two snapshots (i.e. "plurality of data writes"). The precedent snapshot difference list is then used to create precedent backup (i.e., backward increment) which contains all the data blocks identified in the precedent snapshot difference list.

Appellant further argued that Goldstein fails to teach "storing the backward increment; storing the plurality of data writes, and updating the backup storage system so that the data on the data storage system at the second time is the same as the data on the backup storage system at the second time". On the contrary, Goldstein teaches at Col. 6 lines 6-31 the step of storing changes to the data volume between point  $T_1$  and  $T_0$  (i.e., "plurality of data writes") in the precedent snapshot difference list, and storing a first precedent backup

153 which "is made by copying from the first state snapshot 113 all the data blocks identified in the first precedent snapshot different list 143 (i.e. "backward increment"). The first precedent backup  $B_{21}$  are consolidated with the base state backup  $B_{10}$  so that the data on the data storage system at the second time is the same as the data on backup storage system at the second time as claimed (See Col. 5 lines 25-35).

Response to arguments regarding Claim 20.

The method of claim 20 is similar to claim 1, except that it uses both forward increment and backward increment. As discussed above, Goldstein concurrently generates both succedent and precedent snapshot different lists which are used to create succedent and precedent backups (See Abstract) and therefore anticipated the limitation of claim 20.

In response to appellant's argument that Goldstein fails to teach "identifying data blocks in the data storage system that were changed based on the plurality of data writes", the examiner respectfully submits that Goldstein teaches at Col. 5 lines 40-48 that "[a]n important characteristic of the physical incremental backup is that only those data blocks that have changed are copied" and "only the data block containing the updated record, and possibly affected index blocks, are backed up". Goldstein therefore teaches the step of "identifying data blocks in the data storage system that were changed based on the plurality of data writes" as claimed. Appellant's argument that "the data blocks that change between two snapshots is entirely different from the data blocks that change based on the plurality of data writes" is unreasonable because the data blocks can't be changed by themselves, the

data blocks can't be updated, modified or deleted without "data writes from an application program." Therefore , data blocks that change between two snapshot is the same as data block that changed based on the plurality of data writes.

Appellant further argued that Goldstein fails to teach "applying the plurality of data writes to an image on the backup storage system". On the contrary, Goldstein teaches at Col. 6 lines 6-31 the step of using the precedent snapshot difference list (i.e. "plurality of data write") to create a first precedent backup (i.e. "image on the backup storage system").

Finally, appellant argued that Goldstein teaches the step of determining a forward increment or backward increment from the different list, or based on the difference between two snapshot, but does not teach determining a forward increment or backward increment based on the plurality of data write. However, as explained above, there is no difference between plurality of data write and the difference between snapshots. Appellant's discussion of the advantages of the data writes vs. snapshot are not relevant because the claims does not require the knowledge of "what happen between the snapshots" nor "recover the data to any point in time" as argued.

In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies such as "forward increment can then be applied in part, or in its entirely as one transaction to roll the image forward from the first time to any point in time up to and including the second time"

are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Khanh Pham

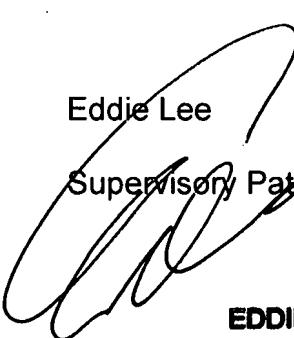
Primary Examiner



Conferees:

Hosain Alam

Supervisory Patent Examiner

  
Eddie Lee  
Supervisory Patent Examiner

EDDIE C. LEE  
SUPERVISORY PATENT EXAMINER